Scott Carey

From: Mike Judge <mike.judge@groupoffice.ch>

Sent: Sunday, October 30, 2022 9:50 PM
To: Scott Carey
Subject: Item #2 — Public Comment for NTRPA Governing Board Meeting November 3rd, 2022
Attachments: EPA-Norbert-Hankin-to-Newton-RE-FCC-2003.pdf; TPC-CELL TOWER SAFETY_Disinformation Flyer2_W.pdf; TPC-CELL TOWER SAFETY_Disinformation Flyer_W.pdf; Wireless Hazards_Washington Spectator.pdf

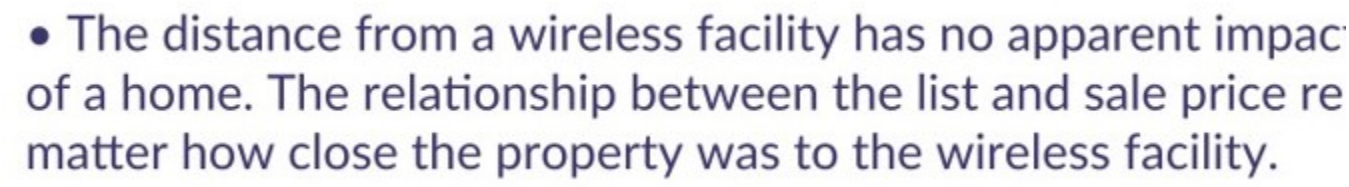
SUBMITTED ON BEHALF OF TAHOE RESIDENTS FOR ACTUAL PROSPERITY

Dear NTRPA Governing Board;

The Tahoe Prosperity Center has apparently hired a graphic designer to manufacture the appended dishonest flyers in a grassroots lobbying effort to secure their cell tower projects. These flyers purport to establish credibility by professing expertise in basic physics, but in doing so, they repeatedly misstate and misspell the basic science concepts—as we will show. They also cite authorities, who do not as a whole, support their claims. They further cite shoddy and unreliable sources such as marketing material. These flyers have the authorship characteristics of someone who is ill-versed in the subject matter, and is only using the material to push a self-serving agenda. It should come as no surprise that Heidi Hill-Drum used to freelance in public relations (PR), a profession almost entirely based upon manipulating people as a means to other ends.

We will now unpack and expose many of the lies on these flyers that are being used to manipulate City officials and the public in order to dismiss facts that are damaging to Heidi's agenda. We quote the attached material and speak nothing but the truth.

1) Economics:



To support Heidi's claim, she cites a single wireless industry business-to-business (B2B) whitepaper. As a marketing tool, B2B whitepapers use selected facts and logical arguments to build a case favorable to the company sponsoring the document; they are not academic or peer-reviewed. Essentially ***all*** peer-reviewed studies by academic land economists on the impacts of cell towers on real estate values find a clear adverse relationship between valuation and proximity. Notwithstanding studies, this claim is plainly absurd on its face—there are obviously a significant number of people who would not want a home with a cell tower on the lawn—and a glossy TPC marketing flyer does not make it creditable or true.

Her bold claim that "a wireless facility has no apparent impact on the value of sale price of a home," is clearly poorly sourced, irresponsible, and factually untrue. Fact-check all of the research links below:

Wireless Towers and Home Values: An Alternative Valuation Approach Using a Spatial Econometric Analysis (Journal of Real Estate Finance & Economics, May 1, 2018)

The Cost of Convenience: Estimating the Impact of Communication Antennas on Residential Property Values (Land Economics, Feb. 2016)

Examining invisible urban pollution and its effect on real estate value in New York City (New York Real Estate Journal September 2017)

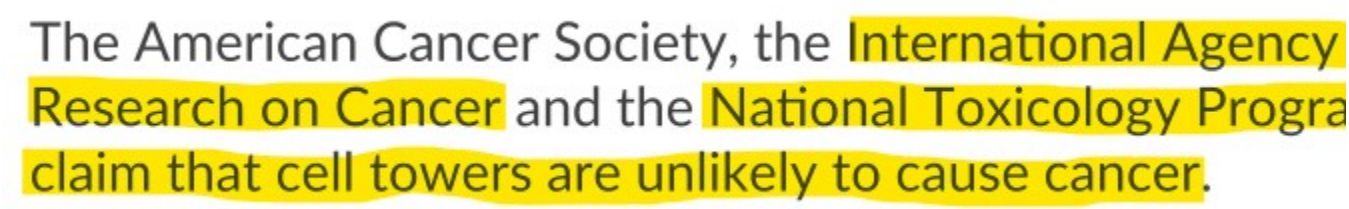
Neighborhood Cell Towers & Antennas—Do They Impact a Property's Desirability? (National Institute for Science, Law and Public Policy (NISLAPP) in Washington, D.C.,)

The effect of distance to cell phone towers on house prices (Appraisal Journal, Fall 2007)

The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods (The Appraisal Journal, Summer 2005)

"Impact of Communication Towers and Equipment on Nearby Property Values" prepared by Burgoyne Appraisal Company, March 7, 2017

2) Flyers contain blatant falsehoods about the positions taken by authoritative agencies. These statements are a particularly heinous public disservice about an emerging threat to public health. Organizations that lie about public health issues have no place in public service. We quote these blatant canards:



Entirely to the contrary, the International Agency for Research on Cancer (IARC) is currently upgrading its existent assessment that **radiofrequency radiation is carcinogenic to humans** (IARC Group 1).

Cancer Epidemiology Update, Following the 2011 IARC Evaluation of Radiofrequency Electromagne Fields (Monograph 102)

Anthony B Miller [1], L Lloyd Morgan [2], Iris Udasin [3], Devra Lee Davis [4]

Affiliations + expand

PMID: 30196934 DOI: 10.1016/j.envres.2018.06.043

Abstract

Epidemiology studies (case-control, cohort, time trend and case studies) published since the International Agency for Research on Cancer (IARC) 2011 categorization of radiofrequency radi (RFR) from mobile phones and other wireless devices as a possible human carcinogen (Group 2 reviewed and summarized. Glioma is an important human cancer found to be associated with I case-control studies conducted in Sweden and France, as well as in some other countries. Incre glioma incidence trends have been reported in the UK and other countries. Non-malignant enc linked include acoustic neuroma (vestibular Schwannoma) and meningioma. Because they allo detailed consideration of exposure, case-control studies can be superior to cohort studies or o methods in evaluating potential risks for brain cancer. When considered with recent animal experimental evidence, the recent epidemiological studies strengthen and support the conclus RFR should be categorized as carcinogenic to humans (IARC Group 1). Opportunistic epidemio studies are proposed that can be carried out through cross-sectional analyses of high, medium low mobile phone users with respect to hearing, vision, memory, reaction time, and other indic that can easily be assessed through standardized computer-based tests. As exposure data are uniformly available, billing records should be used whenever available to corroborate reported exposures.

Moreover, the World Health Organization's (WHO) International Agency for the Research on Cancer (IARC) recommends reducing exposure to radiofrequency radiation (RFR) from cell phones. This is stated in their 2011 Press Release.

In an identical vein, these flyers egregiously **lie to the public** about the clear stance of **the National Toxicology Program** (NTP) which **expressly found that cell tower radiation causes DNA damage and tumors**. We quote the federal agency's website:

The NTP studies found that high exposure to RFR (900 MHz) used by cell phones was associated with:

- **Clear evidence of tumors in the hearts of male rats.** The tumors were malignant schwannoma
- **Some evidence of tumors in the brains of male rats.** The tumors were malignant gliomas.
- **Some evidence of tumors in the adrenal glands of male rats.** The tumors were benign, malign pheochromocytoma.

NTP scientists found that RFR exposure was associated with an increase in DNA damage. Specifically, with significant increases in DNA damage in:

- the frontal cortex of the brain in male mice,
- the blood cells of female mice, and
- the hippocampus of male rats.

It was particularly bizarre for the Tahoe "Prosperity" Center to specifically name a National Institute of Health (NIH) program which found **clear evidence** of radiofrequency radiation (RFR) causing tumors, DNA damage, and cancer as exonerating liability for such. **Lying and cheating** are the desperate methods of those who cannot honestly refute a central claim; it is also the signature of persons who have contempt for public consent, honest debate, and places their own selfish interests ahead of the public's.

She makes an identical lie regarding the Environmental Protection Agency. The EPA has not ruled microwave radiation to be safe either. In fact, congress prohibited the EPA from looking into the matter; as a result, it has not issued policy, rules, or regulations on RFR:

Senate Panel: No EMF Work at EPA

The Senate Committee on Appropriations has cut $350,000 from the Environmental Protection Agency's (EPA) EMF budget, because, "The committee believes EPA should not engage in EMF activities."

In a September 13 report (No.104-140), the committee also stated: "Section 2118 of the Energy Policy Act of 1992 established a federal program to investigate and report on human health effects from [EMFs]. Congress mandated that this program of research and public communication be managed jointly by the Department of Health and Human Services and the [DOE]. No programmatic role was assigned to EPA, yet EPA has pursued a number of unintegrated activities on EMFs that are of questionable value."

The House committee has already announced plans to cut EPA's low-priority radiation programs, which would include its work on EMFs (see *MWN*, J/A95).

Meanwhile, the EPA is reorganizing; effective October 1, the EMF program is moving to a new division, and Dennis O'Connor, the current EMF team leader, has been reassigned to work on the disposal and cleanup of radioactive waste. No replacement has yet been named.

In a deliberate attempt to stifle EMF regulation, radiation limits were transferred to the FCC which is clearly ill-equipped to deal with human and environmental health issues. Despite this, the EPA did issue the attached letter pertaining to the inadequacy of the FCC radiofrequency radiation exposure guidelines—we quote:

that results from an increase in body temperature. The FCC's expos
protective of effects arising from a thermal mechanism but not from
Therefore, the generalization by many that the guidelines protect hur
or all mechanisms is not justified.

.

However, there are reports that suggest that potentially adverse he
may occur. Since EPA's comments were submitted to the FCC in
reporting effects associated with both acute and chronic low-level
increased.

The Tahoe Prosperity Center is wrong in telling City officials and the public that the EPA had determined that radiofrequency radiation is safe. **Heidi Hill-Drum needs to own up to her lies and apologize to the public**.

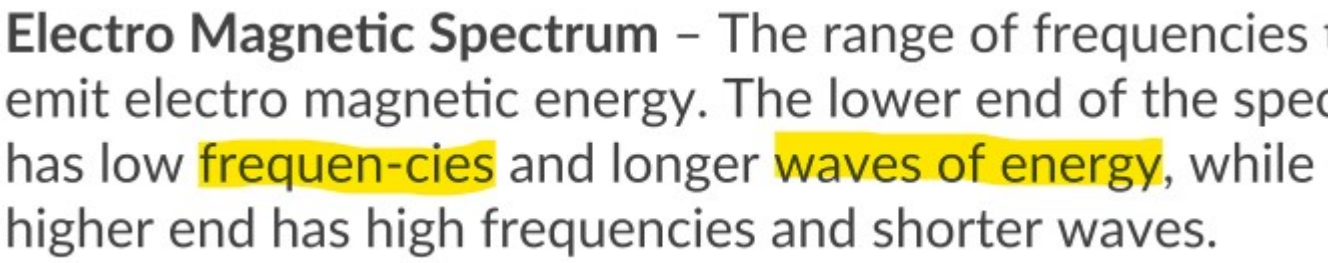
The National Academies of Sciences, Engineering, and Medicine itself also released a new report in December 2020 detailing some mechanisms for significant harm from radiofrequency radiation that may have lead to traumatic brain injury in several cases.

3) The flyers contain misspellings, misunderstandings, and misapplications of scientific concepts. These fall into three general categories: **(A)** confusing electromagnetic radiation with radioactivity; **(B)** not knowing the accepted spelling of fundamental physics terminology; and **(C)** ignorance of the quantum nature of light.

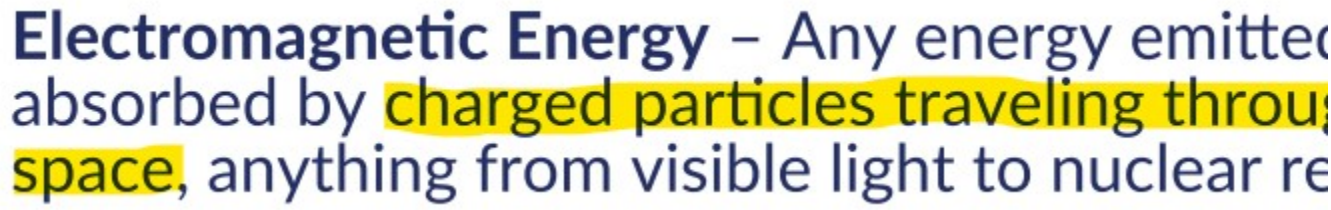
A) The author demonstrates she clearly does not possess even an elementary physics understanding of the difference between "radioactive" decay and electromagnetic radiation. There is no "radioactive range" within the electromagnetic spectrum. Photons are not radioactive.

For instance, the frequencies that carry x-rays
gamma rays are on the radioactive range of th
electromagnetic spectrum, and can cause harr
damage to the chemical bonds in our DNA.

B) The author misspells "electromagnetic," "frequencies," and is utterly ignorant that a frequency (a measure of cycles per second) doesn't emit anything. Nor is there an "end" to a substantive infinite spectrum that somehow "bounds" a discrete "range," where electromagnetic interactions supposedly take place. All carriers of energy and momentum propagate as waves and exchange energy as particles (and no, she does not understand the concept of Plank frequency).



C) The author demonstrates she clearly does not possess even a basic high school understanding of conceptual quantum mechanics:



This is an entirely deficient description, because **electromagnetic radiation consists of photons**. These are uncharged elementary particles—with zero rest mass which are the quanta of the electromagnetic force—they are responsible for all electromagnetic interactions. **There is extreme irony in all of this**, because quantum energy exchange is the fallacious premise that has lead to the misconception that microwaves cannot cause cellular damage. This assumptions is entirely wrong because microwave radiation interferes with electron transport mechanisms (*eg*., oxidative phosphorylation), and triggers gated ion channels (*eg*., axons). This causes the buildup of free radicals and oxidative stress, which are an undisputed mechanism of cancer.

It has been greatly understated in this debate
that the penetration depth of electromagnetic radiation is generally a function of wavelength; the longer the wavelength, the greater the penetration—and the lower the photon energy. With respect to biological effects across the entire electromagnetic spectrum, there are compensating harms as one is exposed to either extrema. On the one hand, photon energies that are greater than ionic or chemical bonds will be expected to result in direct molecular breaks. On the other hand, long wavelength radiation—and its low energy photons—penetrates deep into the body; this is where the wave nature of electromagnetic radiation interferes with cellular electron transport mechanisms,

which indirectly breaks chemical bonds through free radical generation. It turns out that visible light is in the sweet spot of the spectrum being neither ionizing nor penetrating, making it a choice bandwidth for biological optic systems or "eyes." That said, an entire class of chemicals do have bond energies equivalent to those of visible light photons and are known as "light" or "photo" sensitive.

You can read about this to your hearts content. There are over 3,300 pages of peer-reviewed research in proof of this matter on the City record. In addition to this, there is also a list of 1,000 recent peer-reviewed publications on the record. There are even medical textbooks. There is the voluminous BioInitiative Report. This all constitutes a broad body of research by tenured professors across the globe, and cannot be debunked by Cowork Tahoe's capitalistic PhD who laments of having one of the lowest GRE scores on the scale, nearly dropped out of graduate school to become a lawyer, and then misapplied her credentials to sell **crackpot** get-rich-quick startups to gullible investors (*cf.,* Thernos). There is an analogy and lesson in all of this with Elizabeth Holmes, of notorious Theranos fame. That capitalist used the banner of science to defraud investors, and used similar tactics as Heidi Hill-Drum to discredit anyone who referred to science facts that illuminated her fraud. It appears this affiliated PhD has more in common with Holmes than with a bevy of tenured research professors. That capitalist relies on a strong cellular phone signal to demonstrate her hyped-up tenant monitoring software startup Jellyswitch, and is callous to the fact that the invasive cellular phone network architecture causes cancer, neuro-psychiatric pathologies, and harms both residential real estate and neighborhood aesthetics.

Distributed Antenna System (DAS) cell network architecture may instead be installed inside landlord businesses where the users and demand are located. Fiber to the premise implementation of municipal broadband is the superior solution.

4) Last, the Tahoe Prosperity Center relies heavily on a single web page belonging to the American Cancer Society. The **American Cancer Society** is neither an academic authority, nor a professional board, nor a research agency. It is a charity organization, that primarily provides outpatient support to cancer patients, has received widespread criticism for wasting donations on overhead and lobbying, and its stance on cell towers are in conflict with state and federal health agencies.

It has been pointed out, that the organization has been apparently hijacked by tech and biochemical companies who control the organization from investigating the carcinogenic nature of their particular industry products. Its polices are chosen by its board of directors, who are capitalists with an agenda to advance their enterprise, not by objective medical scientists. This will be corroborated below:

AMERICAN CANCER SOCIETY CANCER ACTION NETWORK, INC NONPROFIT

Company Number	EXTUID_2666690
Native Company Number	212917
Status	Active
Incorporation Date	4 September 2001 (almost 19 years ago)
Company Type	Non-Profit Corporation
Jurisdiction	District of Columbia (US)
Registered Address	555 11th Street NW, Suite 300 Washington 20004 District of Columbia United States
Agent Name	C T CORPORATION SYSTEM
Agent Address	1015 15th St NW, Suite 1000, Washington, District of Columbia, 20005
Directors / Officers	C T CORPORATION SYSTEM, agent Coleman, P. Kay, governor Coulter, William E. (Ed), governor Cullen, Kevin J, governor DuBois, Raymond N, governor Glickman, Dan, governor Hamilton, John W, governor Hansen, Christopher W, governor Jackvony, Bernard A, governor Lopez, Jorge Luis, governor Mann, Maureen G, governor Manna, John J, governor Marquardt, Michael T, governor Meuller, Scarlott K, governor Ngo, Rick Q, governor Philips, Timothy B, executingofficer Philips, Timothy B, governor Reedy, Gary M, governor Underriner, William P, governor Waldholtz, Bruce D, governor Youle, Robert E, governor

Can you see why the board of this captured organization is not interested in finding carcinogenic threats posed by the **tech sector**?

First-off, the Chairman of the American Cancer Society is a substantive lobbyist for the Technology Sector which advocates for regulations that favor cell phone and mobile device sales. His strategic interest in the society includes quelling public concern pertaining to the dangers of EMF currently threatening his tech sector constituents.

Christopher Hansen

President at American Cancer Society Cancer Action Network

Washington D.C. Metro Area · 86 connections

Join to Connect

American Cancer Society Cancer Action Network

University of Denver

Company Website

About

Chris Hansen is the President of the TechAmerica Foundation and CEO Emeritus of TechAmerica, the nation's largest association representing all segments of the high-tech industry. In 2008 as the President & CEO of AeA, Mr. Hansen partnered with Phil Bond, then-President & CEO of ITAA, to merge the Associations memberships and services to create TechAmerica.

Before joining AeA in November 2007, Mr. Hansen was AARP's Group Executive Officer for State and National Initiatives. His responsibilities included government relations, advocacy, management of AARP offices in every state, public outreach on key programs, and volunteer management and support. He assumed that position in mid-January 2003, after serving as the organization's Senior Managing Director of Government Relations and Advocacy since March 2002.

Mr. Hansen also worked for 16 years for The Boeing Company. Hansen was known as a political strategist with a broad view and strong interpersonal relations with both Republicans and Democrats. As Boeing's SVP, Government Relations, he directed the company's congressional and executive branch work and its state affairs. Previously, he served as Boeing's VP, Government Relations and VP of Congressional Affairs. Prior to his work with Boeing, Hansen spent 11 years with General Dynamics, where he was Director of Government Relations Operations.

He has held a number of leadership roles in professional organizations, including the U.S. Council for International Business, the National Aeronautics Association, the National Bureau of Asian Research, and currently is a member of the Individual Investors Committee of the New York Stock Exchange. He is also active in philanthropic organizations such as the Wolf Trap Foundation. Mr. Hansen holds a Bachelor of Arts degree in Political Science from the University of Denver and a Master's degree from the American Graduate School of International Management.

...next, the board is directed by a bigwig lobbyist and Clinton cabinet politician:

Dan Glickman

Former United States Secretary of Agriculture

Daniel Robert Glickman is an American politician, lawyer, lobbyist, and nonprofit leader. He served as the United States Secretary of Agriculture from 1995 until 2001, prior to which he represented Kansas's 4th congressional district as a Democrat in Congress for 18 years.

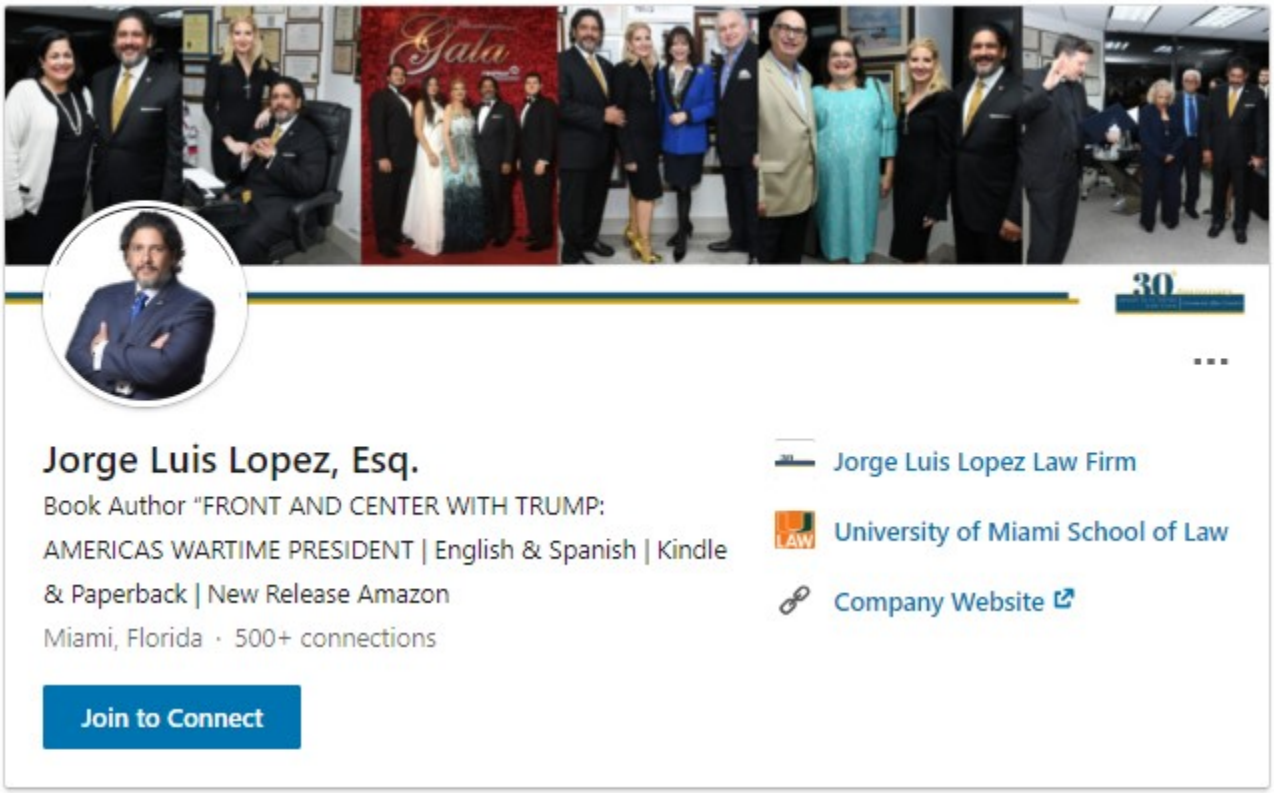
...as well as politician and former Rhode Island Republican Party chairman:

Bernard Jackvony

Lawyer

Bernard A. Jackvony is a former lieutenant governor of Rhode Island and a lawyer who specialises in fiduciary litigation. Born in Providence, Rhode Island, he holds a bachelor's degree from Bryant University, a master's degree from Boston University a and a J.D. degree from Suffolk University.

...a lobbyist-consultant who is also an expert on fundraising strategies (hint ***quid pro quo*** gets money!!!!):



About

Jorge Luis Lopez, Esq., practicing law since 1987, established his governmental affairs practice, the Jorge Luis Lopez Law Firm in 2007. He is recognized as one of the top lawyers in South Florida and the U.S., an expert in political campaigns and fundraising as well as a dedicated philanthropist for charitable organizations in Miami-Dade and South Florida communities.

As a Government Relations Specialist, he represents the interests of private and public sector clients before federal, state and local governments, advising clients on the development and response to government regulations, procurement cycles, land use, zoning and redistricting. He has represented numerous Florida 100 and Fortune 500 companies, including some of Miami's leading companies, in complex intergovernmental matters.

...another Tech venture capitalist:

Mr. Marquardt has been the chief executive officer of Global Kompass Strategies, Inc. since 2009 after serving as CEO of three other companies over the past 25 years. Having lived and worked in Europe, Asia and the United States, he maintains an international network of corporate and government leaders. Mr. Marquardt is a global advisor to corporations around the world, working closely with senior leadership teams on business development, strategic planning and cybersecurity issues. He also advises boards of directors and audit committees on effective risk management measures, corporate governance, geographic expansion, and emerging digital technology opportunities. Mr. Marquardt has extensive experience w corporate turn-around situations, crisis management, succession planning, foreign due diligence and transformation at the enterprise level. He served as chair of the former South Atlantic Division Board, received the Society's St. George National Award in 2017, and has served on the American Cancer So Cancer Action Network's Board of Directors since 2014 and the American Cancer Society Board of Di since 2018.

...then we have a biotech venture Capitalist:

P Kay Coleman

President & CEO at Del Mar Venture Group, LLC

Encinitas, California

Experienced Entrepreneur with a demonstrated history of working in the management consulting industry. Skilled in Executive Development, Business Transformation, Strategic Leadership, Change Management, an.

...there is John J. Manna, Jr., Esq., your run-of-the-mill tech venture capitalist:

Mr. Manna received his Bachelor of Arts from Fordham University and his Juris Doctor from Columbia University School of Law and is currently an investor is real estate and technology ventures.

...Big Pharma executive, Gary Reedy:

Prior to taking the helm of the American Cancer Society, Gary had a distinguished 37-year advocacy leader, most recently as worldwide vice president, government affairs and polic spearheaded initiatives to influence global health policy. He previously devoted more tha business side of the industry, including senior leadership positions with SmithKline Beech Johnson. During his tenure at Johnson & Johnson, Gary served as president of Ortho Biot with annual revenues of more than $3 billion.

...an apparent Evangelical Superintendent for good measure:

Dr. Coulter earned his Bachelor of Science in Education from Ouachita Baptist University and his Mast Education and Doctorate in Education from the University of Arkansas. He and his wife Lucretia live or 400-acre farm and are blessed with 7 children and 15 grandchildren.

...A Buick Dealer! We couldn't make this up. However, automotive products are a leading source of carcinogenic exposure.

WILLIAM P UNDERRINER

Dealer Principal

William P. Underriner, president and co-owner of Underriner Motors in Billings, Mont., is 2012 chairman of the National Automobile Dealers Association and represents Montana's franchised new-car dealers on the association's board of directors. In the automobile business since 1984, Underriner took over the family business in 2001. He currently owns Honda, Hyundai, Buick and Volvo franchises in Billings. Previously, he served three terms as Treasurer of NADA and on the

Furthermore, the American Cancer Society serves also as a lobbyist organization, [spending 4 million dollars a year] of charitable donations in Washington DC:

American Cancer Society

Top Affiliates: ACS Cancer Action Network

CONTRIBUTIONS

Ranks 3,537 of 19,115

$49,418

LOBBYING

Ranks 114 of 5,502 in 2019

$4,450,000 in 2019

The aforementioned people control the American Cancer Society and they have conflicting obligations with their respective industries. They partially use this organization as a "Public Relations" platform to deny the large body of science linking RFR to cancer, and control the narrative. The "Tech Sector" makes generous charitable tax-write offs, with *quid pro quo* strings attached to control the narrative on this emerging health threat; this has paid-off beyond their wildest dreams. Technology and capitalism can be a great thing, but less so for unbridled greed hijacking vulnerable resources.

Notwithstanding, **it is completely inappropriate for a municipality to form its policy entirely off a private charity's webpage**. This would not even pass as an acceptable primary information source for a high school science essay, let alone a government document; basic research and library skills are publicly taught for a reason. The City needs to perform actual **due diligence,** emphasize an inquisitive and professional approach to the public welfare, consult the published scientific literature as well as academic experts, and give heavy weight to the concerns of the public. It is better to be safe than sorry. The Tahoe Prosperity Center has proven itself untrustworthy, and should not be making City policy.

If the Tahoe Prosperity Center were seriously concerned about organic small business prosperity, it's would be advocating for a cellular network architecture of low-power indoor distributed antenna systems (DAS) that supplement seasonal store and restaurant revenue with steady telecom lease income, rather giveaway the town to centralized high-intensity telecom broadcasting which primarily benefits out-of-area corporate titans. The necessary cellular signal emitters should be installed inside places that are the sources of demand, rather than outdoors in neighborhoods, requiring extremely high-intensity broadcasts in futile attempts to penetrate cement infrastructure and facilities. This clutter ought to be installed on the indoor walls of the very businesses that demand towers in other people's residential yards.

If the Tahoe Prosperity center were genuinely concerned about low income internet access as a right, it would be advocating fiber-to-the-premises form of **municipal broadband**, using the City's bulk buying power to ensure the cheapest possible access to all denizens, the solution commonly implemented in cites directly tackling this issue. However, they are advocating for an **extremely specific telecommunications architecture** that **benefits very specific entities**, has very specific loosers, does not even attempt to minimize adverse impacts to residents or the environment, and is using the banner of "charity" sell it.

Submitted on behalf of,

Tahoe Residents for Actual Prosperity

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 16 2002

OFFICE OF
AIR AND RADIATION

Ms. Janet Newton
President
The EMR Network
P.O. Box 221
Marshfield, VT 05658

Dear Ms.Newton:

This is in reply to your letter of January 31, 2002, to the Environmental Protection Agency (EPA) Administrator Whitman, in which you express your concerns about the adequacy of the Federal Communications Commission's (FCC) radiofrequency (RF) radiation exposure guidelines and nonthermal effects of radiofrequency radiation. Another issue that you raise in your letter is the FCC's claim that EPA shares responsibility for recommending RF radiation protection guidelines to the FCC. I hope that my reply will clarify EPA's position with regard to these concerns. I believe that it is correct to say that there is uncertainty about whether or not current guidelines adequately treat nonthermal, prolonged exposures (exposures that may continue on an intermittent basis for many years). The explanation that follows is basically a summary of statements that have been made in other EPA documents and correspondence.

The guidelines currently used by the FCC were adopted by the FCC in 1996. The guidelines were recommended by EPA, with certain reservations, in a letter to Thomas P. Stanley, Chief Engineer, Office of Engineering and Technology, Federal Communications Commission, November 9, 1993, in response to the FCC's request for comments on their Notice of Proposed Rulemaking (NPRM), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (enclosed).

The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, are thermally based, and do not apply to chronic, nonthermal exposure situations. They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn. The hazard level (for frequencies generally at or greater than 3 MHz) is based on a specific absorption dose-rate, SAR, associated with an effect

that results from an increase in body temperature. The FCC's exposure guideline is considered protective of effects arising from a thermal mechanism but not from all possible mechanisms. Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified.

These guidelines are based on findings of an adverse effect level of 4 watts per kilogram (W/kg) body weight. This SAR was observed in laboratory research involving acute exposures that elevated the body temperature of animals, including nonhuman primates. The exposure guidelines did not consider information that addresses nonthermal, prolonged exposures, i.e., from research showing effects with implications for possible adversity in situations involving chronic/prolonged, low-level (nonthermal) exposures. Relatively few chronic, low-level exposure studies of laboratory animals and epidemiological studies of human populations have been reported and the majority of these studies do not show obvious adverse health effects. However, there are reports that suggest that potentially adverse health effects, such as cancer, may occur. Since EPA's comments were submitted to the FCC in 1993, the number of studies reporting effects associated with both acute and chronic low-level exposure to RF radiation has increased.

While there is general, although not unanimous, agreement that the database on low-level, long-term exposures is not sufficient to provide a basis for standards development, some contemporary guidelines state explicitly that their adverse-effect level is based on an increase in body temperature and do not claim that the exposure limits protect against both thermal and nonthermal effects. The FCC does not claim that their exposure guidelines provide protection for exposures to which the 4 W/kg SAR basis does not apply, i.e., exposures below the 4 W/kg threshold level that are chronic/prolonged and nonthermal. However, exposures that comply with the FCC's guidelines generally have been represented as "safe" by many of the RF system operators and service providers who must comply with them, even though there is uncertainty about possible risk from nonthermal, intermittent exposures that may continue for years.

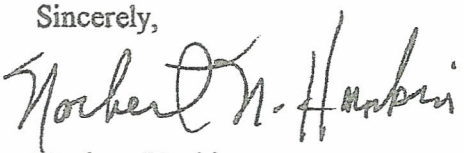
The 4 W/kg SAR, a whole-body average, time-average dose-rate, is used to derive dose-rate and exposure limits for situations involving RF radiation exposure of a person's entire body from a relatively remote radiating source. Most people's greatest exposures result from the use of personal communications devices that expose the head. In summary, the current exposure guidelines used by the FCC are based on the effects resulting from whole-body heating, not exposure of and effect on critical organs including the brain and the eyes. In addition, the maximum permitted local SAR limit of 1.6 W/kg for critical organs of the body is related directly to the permitted whole body average SAR (0.08 W/kg), with no explanation given other than to limit heating.

I also have enclosed a letter written in June of 1999 to Mr. Richard Tell, Chair, IEEE SCC28 (SC4) Risk Assessment Work Group, in which the members of the Radiofrequency Interagency Work Group (RFIAWG) identified certain issues that they had determined needed to be addressed in order to provide a strong and credible rationale to support RF exposure guidelines.

Federal health and safety agencies have not yet developed policies concerning possible risk from long-term, nonthermal exposures. When developing exposure standards for other physical agents such as toxic substances, health risk uncertainties, with emphasis given to sensitive populations, are often considered. Incorporating information on exposure scenarios involving repeated short duration/nonthermal exposures that may continue over very long periods of time (years), with an exposed population that includes children, the elderly, and people with various debilitating physical and medical conditions, could be beneficial in delineating appropriate protective exposure guidelines.

I appreciate the opportunity to be of service and trust that the information provided is helpful. If you have further questions, my phone number is (202) 564-9235 and e-mail address is hankin.norbert@epa.gov.

Sincerely,



Norbert Hankin
Center for Science and Risk Assessment
Radiation Protection Division

Enclosures:

1) letter to Thomas P. Stanley, Chief Engineer, Office of Engineering and Technology, Federal Communications Commission, November 9, 1993, in response to the FCC's request for comments on their Notice of Proposed Rulemaking (NPRM), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation
2) June 1999 letter to Mr. Richard Tell, Chair, IEEE SCC28 (SC4) Risk Assessment Work Group from the Radiofrequency Radiation Interagency Work Group

The WASHINGTON SPECTATOR

by Barbara Koeppel

Dec 28, 2020 | Health

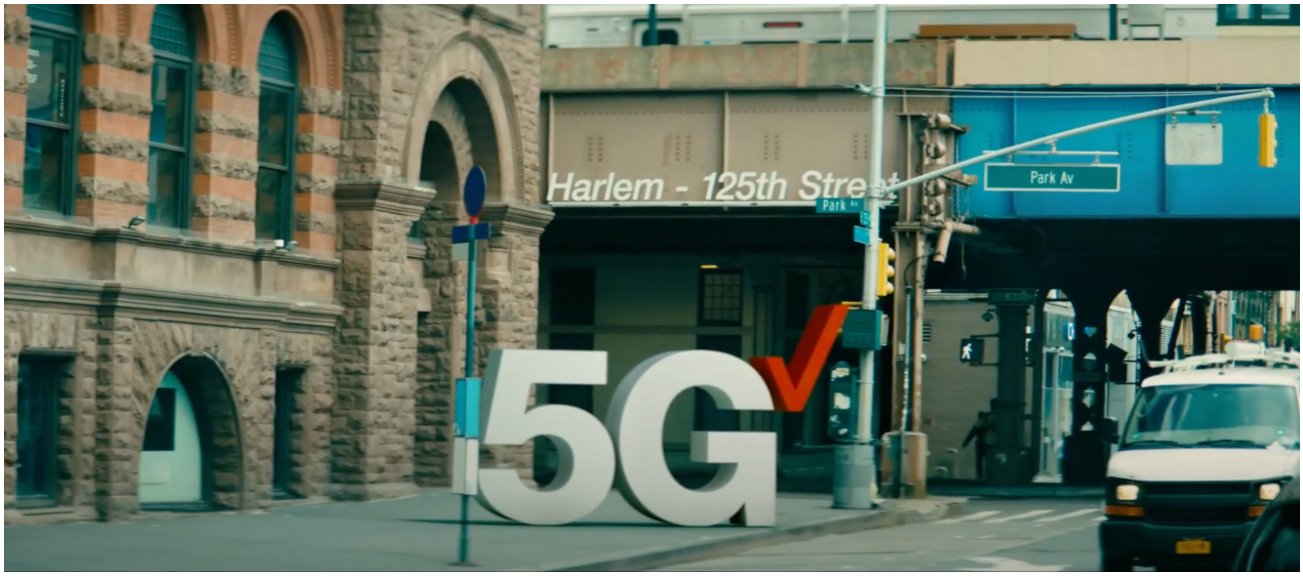


PHOTO CREDIT: Verizon Wireless video advertisement

If you think your cellphone is safe, have you considered why you believe that? Is it a fact or is it based on carefully crafted messages that you've read or heard?

For the past few decades, the telecom wireless industry and its enthusiasts have heralded cellphones as the greatest achievement of the late 20th and early 21st centuries. But as their use soars, scientists worldwide worry about their hazards and have produced over 2,000 studies that tell a darker tale. They warn that the devices and antennas that power them expose humans and wildlife to nonionizing low-frequency electromagnetic fields—also called cellphone, microwave, or radio-frequency radiation. These studies indicate that when people and animals are exposed, they can develop brain, thyroid gland, prostate gland, acoustic nerve, and breast tumors, and other diseases.

Not surprisingly, the industry argues this type of radiation is safe, because it is unlike the high-frequency ionizing radiation used in X-rays, which can directly damage DNA.

Still, scientists say low frequency doesn't mean harmless. For example, based on data from the U.K. Office of National Statistics, Alasdair Philips, an engineer, scientist, and trustee of Children With Cancer U.K., found that cases of brain tumors (glioblastomas) in Great Britain from 1995 to 2015 mushroomed, from 983 to 2,531.

Why? Philips says, "There's adequate proof that exposure from wireless devices affects cancer cells. Even if they don't start the cancers, they speed up the rate at which the cancer cells multiply. This is true of all the devices —cellphones, tablets, and cordless phones people use in their homes—since they have built-in antennas that communicate with cell towers.

"The exposure is quite significant because people hold their devices near their heads for hours while they stream videos and other materials." He warns that the exposure is particularly potent when the reception is poor: "At such time, the signal's strength can increase by even a millionfold."

Philips says the upsurge in tumors is mainly among those over 50—since this age group typically has more tumors. But, although very few 10-to-15-year-olds get brain tumors, that number is also increasing. He adds that "besides

promoting cancer, microwave radiation makes lower-grade tumors become more aggressive."

Robert Kane, an electromagnetics engineer who designed and tested wireless devices for Motorola and other firms starting in the 1980s, warned of the dangers in his book *Cellular Telephone: Russian Roulette* (2001). Given his position inside the industry, he was able to confirm that cellphone companies knew their products could harm and even kill, but, like the tobacco, asbestos, and fossil fuel industries, they kept the news quiet. Besides the increased risk of tumors, Kane also described hundreds of studies since the 1950s that found that low-level radiation damaged DNA and tissues and caused loss of memory and motor skills, and cataracts. Kane died of a brain tumor in 2002.

The industry rejects the data. Its main trade group, the Cellular Telecommunications Industry Association (CTIA), states "wireless devices do not pose a public health risk for adults or children." Although it admits devices and cell towers emit radio-frequency radiation, it says this exposure can only cause acute, short-term overheating of human and animal tissues. But the CTIA also insists this doesn't happen, because the amount of radiation is minuscule. Instead, it argues that long-term illnesses such as cancer are a fiction of marginal alarmist researchers.

Even the $30 million, decade-long study by a National Institutes of Health division called the National Toxicology Program, the results of which were released in 2018, didn't dent industry's denials. For two years, NTP scientists exposed rats to cellphone radio-frequency radiation and found "clear evidence of cancer in the male rats' heart cells, some evidence of increased brain gliomas (brain cancer) and adrenal gland tumors, DNA damage in the brains of male and female rats and mice, lower birth weights of female rats' offspring, and decreased sperm quality." Ron Melnick, a senior scientist (now retired) at the NTP who led the design of the study, says they also found tumors in the rats' prostate glands. The numbers were confirmed by a panel of experts.

Still, the story was squashed: the press mostly ignored or dismissed it. And the U.S. watchdog agencies—the Federal Communications Commission and the Food and Drug Administration, which set the safety regulations for wireless devices—disputed the findings. The FDA argued that "the study was not designed to test the safety of cellphone use in humans, so we cannot draw conclusions about the risks [to humans] from it." Melnick says, "This statement was odd because when we were designing it, the FDA told us an animal study was needed. But when we announced the results, the FDA said, 'The current safety limits for cellphone exposure, set in 1996, remain acceptable.'" And the FCC concurred.

Melnick sought feedback from scientists outside the NTP and asked one who worked for Motorola to discuss the results. "He refused. He told me we already have lots of studies that don't show these effects," Melnick says.

The FDA and FCC claimed the results were skewed because NTP scientists exposed the rats' entire bodies to higher doses of radiation than cellphones typically emit. But their arguments were countered by scientists at Italy's Ramazzini Institute (a nonprofit cancer research center in Bologna) who exposed 2,500 rats in the fetus and until their death to lower doses of radiation than those emitted in cellphones. These animals developed the same rare heart cancers.

Why are the deniers so adamant? "It's all about money, since there are billions, even trillions, at stake," says Jerry Phillips, a biochemist who directs a science center at the University of Colorado. Indeed, in 2018, global cellphone sales were more than a half-trillion dollars.

The industry is spectacularly successful in ensuring that its message echoes far and wide: its profoundly deep pockets purchase seats at all the right tables in the global and national watchdog agencies, media organizations, and scientific associations—which manage the misinformation. Thus, industry's billions decide which scientists and studies get funded or defunded, which get quoted or discredited, which agency commissioners bounce back and

forth from telecom companies and corporate law firms, and how dissenters—such as U.S. states and cities—are sued and usually silenced.

At present, the industry and its backers are hyping 5G—the newest generation of devices, following 2G, 3G, and 4G. Online, in newspapers and on television, we are told 5G will change life as we know it—with vastly increased speeds for streaming material and devices that are able to communicate with each other (sometimes called "the internet of things"). The ads also promise that 5G will add $500 billion to the U.S. economy. Verizon, a key player, even claims it "will help doctors see cancer like never before."

The scientists worry even more. They say 5G technology uses millimeter waves, along with microwaves (the type in current devices). Because 5G waves can only travel short distances, antennas and towers need to be installed every 300 to 600 feet on every block across the country, to receive and send signals. And this, Philips says, "increases the exposures exponentially."

Joel Moskowitz, director of the Center for Family and Community Health at the University of California, Berkeley, says "because the technology is so new, we have no way to know about the long-term health effects. But we do know that millimeter waves are absorbed in our skin and on the cornea and can harm the immune, nervous, and cardiovascular systems."

The U.S. Government Accountability Office agrees—although it buried the warning on page 42 of a report it released this past November. The GAO quotes a National Cancer Society scientist who said "no studies of 5G frequencies have been conducted on the long-term health effects because the technology hasn't been deployed long or widely enough." Worse, the scientist warns the effects may not be known "for many years, because some outcomes could take decades to develop."

Still, the GAO has hyped the 5G debut, as have the other U.S. agencies: It posted a video featuring Tom Wheeler, the former FCC chair and CTIA CEO,

who, not surprisingly, never mentioned the health issues.

However, given the industry's daily drumbeat, there is a dramatic disconnect between the critics' concerns and public awareness. As a result, only 5 percent of U.S. adults worry that cellphones are harmful, and parents buy them for their children: in 2019, 53 percent of children under 12 and 84 percent of teens had them.

Further, few people know that when reception is poor and phones show just one or two bars—say, when users are in subways, elevators, cars, basements, or some rural areas—the devices need more energy to communicate with cell towers and other phones. Philips explained that this leads to a massive increase in exposure. This conclusion was also noted in a 2017 California Department of Public Health advisory titled *How to Reduce Exposure to Radiofrequency Energy From Cellphones*, which led the department to warn the public not to use phones in such places.

For their part, the manufacturers and telecom companies don't mention this concern. Instead, they inform users about the proper distance to hold phones from their bodies to avoid excessive exposure (from 5 to 25 millimeters away—about one-fifth of an inch to an inch). But they bury even these modest advisories deep inside the owner manuals.

Moskowitz says, "The problem is that we really don't know what distance is safe for people who use the devices over many years." Thus, he and other scientists I interviewed said they only use wired landlines at home; and, when out, they carry cellphones in backpacks, brief cases, or tote bags.

However, the industry's message is so widely accepted that contradictory information is routinely discarded. One scientist (who asked for anonymity) told me he recently was asked to advise a state committee about 5G guidelines. "When I tried to tell them about the hazards from the hundreds of thousands or millions of new antennas that will be installed, they weren't interested. Instead, they only looked at materials from a telecom company,

which said the 'greatest risks from cellphones are traffic deaths due to drivers being distracted.'"

Similarly, when the U.K. National Radiological Protection Board warned, as early as 2000, that people should keep calls short and use hands-free earpieces, the FDA and FCC insisted "the scientific evidence does not show a danger."

The disconnect was striking at two meetings I attended in Washington D.C. about the coming of 5G. Both had panelists from the D.C. government and industry who championed its benefits. During the Q&A, when someone asked about safety issues, panelists confidently claimed there were "none."

Compromised watchdogs

How does industry carry it off? First, the watchdog agencies continually reaffirm the industry's message, and because of their authority, they're considered objective. Yet their conflicts of interest are pervasive. For example, in 2013, President Obama named Tom Wheeler, the CEO of the main trade group, the CTIA, to chair the FCC. In a 2016 talk, Wheeler said, "We won't wait for standards to be developed. . . . Instead, we will rely on the private sector to produce them." On 5G, he told doubters to "stay out of the way. . . . Tens of billions of dollars in economic activity . . . is what's important."

President Trump replaced Wheeler with Ajit Pai, a former Verizon legal counsel and attorney at Jenner & Block, which represents the CTIA. As Jenner & Block's site boasts, "No firm has the experience and credibility we enjoy before the FCC."

This is not an idle claim. Pai—the regulator in chief—dislikes regulations. In 2018, he repealed the FCC's net neutrality rules, which, *Los Angeles Times* business columnist Michael Hiltzik noted, "involves billions of dollars in

potential profits for Verizon and other firms."

Moreover, Pai is determined to quash 5G opponents. In 2018, the FCC issued an order that would force cities to stop blocking companies that were installing 5G antennas. The order also lets the firms sue cities if they don't approve their installation plans in 60 or 90 days. Further, it says that companies needn't wait for health or environmental studies to prove the equipment is safe: instead, they only have to say they comply with FCC rules.

The FDA is just as obliging. Jeffrey Shuren, who heads its Center for Devices and Radiological Health, is an industry loyalist. As Justin Klein, a partner at Vensana, a medical technology venture capital firm, observed, "Shuren has won the trust of the device world through . . . his 'industry-friendly record.'" A May 2019 CBS news report confirmed this: when France banned certain breast implants that researchers linked to lymphoma in 2019, Shuren said they were safe—and left them on the U.S. market.

Shuren also does not welcome whistleblowers. A 2012 *Orthopedics Journal* story said that when he ran the FDA unit approving new devices, nine of its scientists warned that a CT scanner they were evaluating could cause cancer. Within months, Shuren fired all nine. Two years later, a U.S. congressional committee reported that Shuren had bugged the scientists' computers to record their activities.

In fact, the U.S. federal government thrives on a thriving telecom industry. In *Captured Agency* (a monograph published in 2015 by Harvard's Center for Ethics), journalist Norm Alster wrote that the government had reaped nearly $100 billion in prior years from selling space on the electromagnetic field spectrum, through which the companies send their signals. Alster says local governments also prosper, collecting an average of 19 percent from users' cellphone bills.

Other deniers

Henry Lai, a University of Washington bioengineer researcher, says the industry's influence is so profound that "even the American Cancer Society accepts its views." So, too, have other respected groups, such as the World Health Organization and the U.S. Centers for Disease Control and Prevention, which repeat the "no radiation problems" refrain.

For example, when the National Toxicology Program released the results of its study—citing cancers in the heart cells, brains, and adrenal glands of laboratory rats exposed to cellphone emissions—an American Cancer Society site said, "Updated Cellphone Study Findings Still Inconclusive," the exact opposite of what the scientists concluded. In fact, the ACS's chief medical officer at the time, Dr. Otis Brawley, said, "The evidence for an association between cellphones and cancer is weak."

Could the ACS have industry ties? I asked Kathi Di Nicola, director of ACS media relations, for its donor list. "We do not release individual or partner giving, unless required by law," she emailed back. But an ACS site called "Our Partners" lists Goldman Sachs, Bank of America, and JP Morgan, whose clients include the telecom giants; other partners are the giants themselves, such as Microsoft, United Technologies, and World Wide Technology.

For its part, the CDC switched its position about wireless dangers without offering any reasons. Theodora Scarato, executive director of the Wyoming-based nonprofit group the Environmental Health Trust, which works with communities and health professionals to promote research and policies, says that, in June 2014, the CDC website recommended "caution in cellphone use" and noted that "more research is needed . . . before we know for sure if cellphones cause cancer."

Just two months later, most of the message had disappeared and was replaced by one line: "There is no scientific evidence that provides a definite answer to that question [can using a cellphone cause cancer?]." Scarato notes that her nonprofit submitted hundreds of Freedom of Information Act requests to the CDC to determine why; in doing so, it learned that the CDC

had hired Kenneth Foster, an industry consultant, in 2015, to write that agency's new web pages on the health effects of wireless technology.

The WHO has also straddled both sides. In 2011, just one month after its division the International Agency for Research on Cancer (IARC) defined cellphone radiation as a *possible* human carcinogen, a WHO fact sheet claimed "no adverse health effects have been established." However, Alasdair Philips notes that many IARC scientists now believe the group should revisit the issue and change the assessment from possible to probable.

Further, the WHO consistently adopts the views of the International Commission on Non-Ionizing Radiation Protection, or ICNIRP, which, since its founding in 1992, has argued that electromagnetic frequency, or EMF, radiation can only cause damage by heating body tissues, which, it says, wireless devices don't do. The WHO also defers to the United States (whose position is articulated by the FDA and the FCC), which, until recently, when President Trump cut U.S. funding, was the WHO's largest contributor.

Dariusz Leszczynski, a University of Helsinki biochemist, says ICNIRP's views haven't changed because its current members only choose new members who share their beliefs. His opinion is confirmed by James Lin, a University of Illinois professor of engineering, physiology, and biophysics, who was an ICNIRP member for 12 years. He told me, "If you look at the group's output, it says the same things industry says."

Moreover, many ICNIRP members have serious conflicts of interest. While they're supposed to list their income on Declaration of Interests forms, they often don't. For example, Michael Repacholi, an Australian biophysicist and ICNIRP's first chair, also founded a WHO project in 1996 to study cellphone radiation effects. But Louis Slesin, editor of *Microwave News*, reported in 2006 that Repacholi admitted the telecom industry had funded half the WHO project's budget. When he left WHO in 2006, Repacholi soon became an industry consultant.

Andrew Wood, who is on the ICNIRP's Scientific Advisory Group, runs a lab at Swinburne University in Australia supported by the Telstra Corporation, which builds and operates digital networks, provides mobile and internet access, and is that country's largest telecommunications company. Telstra gave Wood's lab some equipment and sent its staff there to test Telstra's products.

Rodney Croft, an ICNIRP member since 2008, told an Australian Broadcasting Corporation news show, "A lot of research . . . has clearly shown there aren't any health effects." However, Croft didn't mention that the research center he directed was created with Telstra funding and lab equipment.

Rene de Seze, in ICNIRP for over a decade, left his Declaration of Interests form completely blank—not listing grants from France Telecom or his work for Motorola.

Even the National Institutes of Health (NIH) has minimized the radiation hazards. For several years, it sponsored *Healthy Building Roundtable* conferences, the last one in 2018. On July 19 and 20, speakers on the Electro Magnetic Frequency (EMF) panel described the dangers of wireless devices, circulated material at the conference, and posted it on the NIH–Healthy Buildings Roundtable website. It said, "Current FCC public radiation exposure guidelines were set decades ago, based on the outdated premise that devices need to emit enough heat to raise the temperature of one's skin to cause harm. There are now over 25,000 articles published, and the majority of non-industry funded studies show great evidence of biological harm at the non-thermal level."

The message still appeared in September, but by early October, it had disappeared. So, too, had any mention of the EMF panel.

The loyal press

Besides the industry's sway with the agencies, its influence on the press and media means that coverage of wireless devices is almost always upbeat. First, the industry buys full-page ads that promote its services and products and now continually tout 5G. Then there are the owners' personal conflicts. For example, *The New York Times*' largest single stockholder is Carlos Slim—the world's richest man in 2013—who holds 17 percent of the newspaper's stock and whose company, America Movil, is Latin America's biggest telecom provider. And Verizon is partnering with the *Times* on a 5G project.

Most press and media repeat the agencies' positions and debunk or ignore studies that describe the dangers. Since *The New York Times* is America's paper of record, its coverage is instructive.

In a May 2019 *Times* story, "Your 5g phone wont hurt you. But Russia wants you to think so," the journalist William Broad quoted Marvin Ziskin, a Temple University professor of radiology, who claimed, "5G emissions, if anything, should be *safer* [emphasis added] than previous generations' exposure of the body's internal organs." But Ziskin's papers, many co-authored by Kenneth Foster, a professor in the Department of Bioengineering at the University of Pennsylvania, are funded by the Wi-Fi Alliance and the Mobile & Wireless Forum, or MWF, a trade group whose members include Apple, Motorola, Samsung, and Sony. As industry favorites, Foster and Ziskin were invited to chair MWF's 2016 workshop sessions in Belgium, and Foster gave the keynote address.

Broad also quotes David Robert Grimes, whom he identifies as an Oxford University cancer researcher. Besides his statements supporting 5G and wireless devices, Grimes discredits the work of David Carpenter, former dean of SUNY's School of Public Health in Albany who has long warned of cellphone hazards: he claims that "Dr. Carpenter's scariest alarms have been widely dismissed by scientific bodies the world over."

But Grimes isn't a reliable judge. His website has a link to his Oxford work, but the link, when clicked, states, "The page is not found." Grimes's site also

notes his work at Queen's University in Belfast, but, as of December 2019, Queen's no longer listed Grimes in its online directory.

Moreover, Grimes's research is on human consumption of oxygen—not cellphone radiation. And although Broad doesn't mention this, Grimes gets industry funds: in one of his papers, Grimes thanks the NVIDIA Corporation for "generous hardware donations" to his research project on radiotherapy (NVIDIA makes parts for smart phones, tablets, and game systems and had an income of $4 billion in 2018). Grimes also thanks Cancer Research U.K. for its support—an institute that partners with the Francis Crick Research Institute, whose chair is Baron Edmund John Philip Browne, British Petroleum's former head and now chair of Huawei Technologies U.K.

In July 2019, the *Times* ran another story, titled "5G, Don't Fear the Frequency," under a huge multicolored drawing of panicked people. Broad writes that Bill Curry, a physicist who warns about radiation dangers, produced "flawed reports" about the damage of microwave radiation, which were adopted by "alarmist websites." Again, he quotes Grimes, who states, "If phones are linked to cancer, we'd expect to see a marked uptick. Yet we do not." This assertion contradicts research conducted by Alasdair Philips, who used numbers from the U.K. Cancer Registry to document the increase in aggressive brain tumors.

In fact, Broad's articles reveal consistent biases. In reviewing two books on global warming in 1998, he said, "[W]e live in a great climate experiment, the outcomes of which, good or bad, no one is likely to forecast with any certitude." This assurance came nearly 20 years after a National Academy of Sciences report predicted global warming of 2 to 3.5 degrees Celsius (3.6 to 6.3 degrees Fahrenheit)—with greater increases at high latitudes.

In 2007, Broad called Al Gore's documentary *An Inconvenient Truth* "exaggerated." To prove his point, he quoted Don Easterbrook, a geologist who saw "a lot of inaccuracies." But this is the same Easterbrook who told a Washington State Senate Energy, Environment, and Telecommunications

Committee that “global warming ended in 1998.”

Broad’s science denials resurfaced in October 2019, when he wrote that plastics, a major source of ocean pollution are “less devastating than usually portrayed.” To support this assertion, he quotes a marine chemist who claims that “sunlight can degrade them in centuries or even decades,” not a timeline that accords with sustainable management of the world’s marine and coastal environments.

Although most press and media support the industry’s position, there are some rare exceptions. For example, the *Chicago Tribune* launched its own study to measure the radiation from Apple, Samsung, and Motorola cellphones. In an August 2019 article, the *Tribune* said the testing laboratory found that many models exceeded the FCC exposure standards, “particularly when tested close to the body.”

The *Baltimore Sun*, covering a May 2016 Pediatric Academic Society annual meeting, quoted physicians who warned parents to limit their children’s cellphone use. And in October 2005, a *Florida Sentinel* story noted that researchers worried that “radiation enters users’ heads, and over time might pose serious health risks, including cancer.”
Research and retaliation

Industry’s impact on research is also enormous. Henry Lai, the University of Washington bioengineer researcher, reviewed 326 studies on radio-frequency radiation carried out from 1990 to 2005 and found that half showed harmful biological effects, while half did not. When he checked who funded which ones, the numbers diverged dramatically: of those that were independently funded, 70 percent found harmful effects, while among those funded by industry, only 30 percent reported finding them.

For researchers who refute the message, retaliation is certain. A few examples are useful. John Allis, a physical chemist, and Carl Blackman, a biophysicist, were among a group of scientists at the Environmental

Protection Agency studying low-intensity EMF radiation from the 1970s until the mid-1980s—to determine its effect on brain tissue. Allis says that although 'low' sounds benign, it "penetrates more deeply than X-rays." Since their research predated cellphones, they studied the radiation from electric power lines and the military's radar installations.

"We exposed newly hatched chickens' brains to it and found that this changed their brain tissues. It was a crucial discovery that we wanted to study further, but EPA stopped our funds," Blackman says. He then got Department of Energy support, but it also ended, and his equipment was thrown away.

Why? Allis says that "in the 1980s, the Reagan administration was pushing 'Star Wars,' which was thought to need nonionizing radiation to make it work. The scuttlebutt was that Washington didn't want to know it had negative effects. So it stopped the funds."

Lai and his research partner, N.P. Singh, a professor of bioengineering at the University of Washington, exposed rats' brains to radio-frequency radiation at an intensity the FCC said was safe. But after just two hours, the radiation broke or damaged the DNA in their brain cells—which can lead to mutations and cancer. When they published their results in a 1995 issue of *Bioelectromagnetics*, Motorola cut their funds and counterattacked: Slesin posted a leaked memo in a 1997 MicrowaveNews, which showed (under Media Strategy, p.13) that Motorola wrote to its public relations firm telling how to discredit them.

Lai and Singh then got a Wireless Technology Research grant (under the trade group CTIA) to continue their studies. But Lai says WTR continually tried to "dictate the design of our experiments." After many confrontations, George Carlo, WTR's head, wrote the University of Washington president (Richard McCormick), threatening legal action and telling him to fire Lai and Singh. McCormick refused. The scientists still had NIH funds to continue their research on extremely low-frequency fields, and published a paper in

2005. But it was their last.

Om Gandhi, a University of Utah professor emeritus, studied how humans absorbed cellphone radiation and, by the 1990s, was focusing on children because, as he explains, “their skulls are thinner than adult skulls and they absorb much more.” He also found that for every millimeter closer to their heads people hold their phones, the absorption rate is 15 to 30 percent higher. When he published these results, his funders stopped funding. “Without the grants, I had to close my lab,” he said. Some years later, Devra Davis, an epidemiologist who co-founded the Environmental Health Trust, co-wrote a paper with Gandhi. She says that a five-year-old child’s skull absorbs about 10 times as much radiation as an adult’s skull. But when companies test phones, they use a one-size-fits-all model based on the head size of an adult male.

Jerry Phillips (before he went to the University of Colorado) was at the Veterans Affairs Medical Center in Loma Linda, California, where the team with which he worked got Motorola funds to study EMF radiation. The researchers exposed rats in the fetus and newborns to the radiation and found that under certain conditions, the signals affected brain tissues. “Motorola didn’t want to hear this and told us not to present our results. But we did, anyway,” Phillips says.

After this, the company asked the team to study the DNA breaks that Lai and Singh had found, but he said, “Motorola wanted us to reach different conclusions. What we learned was that different exposures increased *and* decreased DNA damage. Motorola didn’t like this, either, since it wanted to hear that there were no effects. It told us to do more research and not publish our data. A friend at Motorola advised me ‘give Motorola what it wants, or this could harm your career.’

“Although I knew government funds hadn’t been available for such studies for years, I couldn’t work with Motorola’s restrictions. So I took myself off the project. If I hadn’t, Motorola would have. I left California and haven’t done this

type of research since."

Phillips says Motorola asked several other researchers to disprove what the group at Loma Linda, as well as Lai and Singh, had found about the damage to cells. And some obliged the company. "It's possible to do this, since the way you design studies determines what you'll find.

"This is how industry manages to confuse the public. It stops funding research it doesn't like and promotes the results it likes. It also says the studies cancel each other out." That is, if some find harmful biological effects and others don't, then the former don't count. "This isn't correct," Phillips says.

Lai adds that industry enthusiasts always claim there's a lack of research about the long-term effects, but this isn't true: over 500 epidemiological and animal studies have shown that cellphone radiation causes biological damage. Lai told Slesin, "The industry says half the studies don't show effects. But even if this was true, could the other half all be garbage?"

Reseachers' findings

Brain tumors and blood leaks Several scientists have reported on these health problems. Berkeley's Joel Moskowitz, who writes a blog on electromagnetic radiation, says that in 2017, several journals, such as *Biomedical Research International* and *Neurological Sciences*, published various scientists' reviews of the many studies carried out on brain tumors. They found that "each reported a 'statistically significant' link between heavy cellphone use (of 10 or more years) and brain tumors, especially on the side of the head where people hold their phones (called *ipsilateral* use)."

One review was by Lennart Hardell and Michael Carlberg, whose earlier work on brain tumors is considered the gold standard and was a key reason the International Agency for Research on Cancer classified cellphone radiation as

a possible carcinogen. In their review, Hardell and Carlberg found that the highest risk of glioma—brain cancer—occurred among the heaviest users, and they reported in a 2013 issue of the *International Journal of Oncology* that people using cellphones at least 30 minutes a day for nine years "had nearly three times the glioma incidence. If they started as teenagers or earlier, the risk was four times higher." They also found meningiomas (slow-growing, mostly nonmalignant brain tumors) and acoustic neuromas (tumors on auditory nerves leading from the inner ear to the brain).

Further, a $25 million Interphone Study, funded by the European Union and others, was carried out by scientists in Australia, Canada, Denmark, Finland, France, Germany, Israel, Italy, New Zealand, Japan, Norway, Sweden, and the U.K. They compared approximately 5,000 cases of tumors to a similar-size control group. Many of the researchers said the results were consistent with previous studies that showed increased risks for glioma or acoustic neuroma tumors among the heaviest cellphone users.

Two other studies also found serious risks. The French CERNAT study reported in May 2014 that those using phones 30 minutes a day for five years had a higher risk of brain tumors. And a Chinese study by J. Tang (published in *Brain Research* in 2015) found that rats exposed to cellphone radiation had leakage in the blood-brain barrier and cognitive impairment.

DNA damage Besides the Lai and Singh studies, the REFLEX study (for which the European Union gave three million Euros to 12 institutions) found that cellphone radiation damaged human cells and DNA. As noted earlier, the NTP study also found DNA damage in rats and mice.

Thyroid tumors Berkeley's Moskowitz says the incidence of thyroid tumors —especially the papillary type, which is the most sensitive to electromagnetic field radiation—is increasing in many countries. He explains that because of the way phones are designed, much of the radiation is directed toward the neck, where the thyroid gland is located. He says the CDC reported a rapid rise of these tumors among children in the United States, and Hardell and his

colleagues wrote about this in 2016. Finally, he says a 2019 Yale University study found increased thyroid cancer among heavy cellphone users.

Male infertility The Cleveland Clinic Center for Male Fertility found that when men carried phones in their pants pockets, their sperm were weakened and reduced, which can cause infertility.

Hypersensitivity A growing number of physicians and scientists are reporting that some individuals are particularly sensitive to EMF radiation. Their symptoms, which can be quite pronounced, include tinnitus, vertigo, headaches, fatigue, and memory loss.

Insurance companies deny coverage

Interestingly, the risk-averse insurance industry has been reluctant to offer coverage for the companies or those who use the devices. For example, insurance authority Swiss Re classified wireless devices as "high risk," while Lloyd's of London underwriters adopted the "Electromagnetic Fields Exclusion Clause": this means it will not cover "damages or illnesses caused by continuous long-term non-ionizing radiation exposure through mobile phone use." As journalists Mark Hertsgaard and Mark Dowie noted, in a July 2018 *Guardian* article, they didn't find a single insurance company that would sell a policy covering cellphone radiation. "Why would we?" one executive told them . . . pointing to over two dozen lawsuits against wireless companies, demanding $1.9 billion in damages.

Countries' concerns

Unlike the United States, some countries have tightened their exposure rules. For example, Belgium banned companies from marketing phones specifically designed for children under seven.

Cyprus banned Wi-Fi in nursery schools and kindergartens and launched an

advertising campaign to educate parents. Also, it removed Wi-Fi from Archbishop Makarios hospital.

France, which has the world's strictest limits, banned wireless devices in daycare centers for children under three, required Wi-Fi to be turned off in elementary schools when not in use, and ordered towns to map the locations of antennas, measure their radiation levels, and give this data to the public. Also, it required that ads state the various models' exposure levels (with fines of up to 75,000 Euros if they don't comply); further, the ads may not show children using phones or people holding the devices next to their heads.

India reduced the cell tower radiation limit to one-tenth of the cap recommended by ICNIRP, and some states and cities ordered companies to remove their towers that were located near hospitals and schools.

Israel banned Wi-Fi in kindergartens, limited it in first and second grades to three hours a week, required companies to list the phones' radiation levels, and banned ads that show children using phones. Haifa's school district required computers to be hard-wired.

In Poland, Krakow's mayor distributed free meters to its citizens to measure their devices' exposure levels and tightened zoning rules, which limit the areas where towers can be located.

And in Switzerland, Geneva is one of several cities and towns that placed a moratorium on 5G.

States, cities, and scientists fight back

Alarmed about the hazards from wireless devices, 254 scientists from 44 countries have urged the United Nations to toughen the exposure guidelines and "educate the public about the health risks." The U.N. has not replied.

With the advent of 5G, warnings are even stronger: By October 2020, 407 scientists and physicians appealed to the European Commission "to halt the roll-out of 5G . . . which will substantially increase exposure to radiofrequency electromagnetic fields." This has also been ignored.

Many U.S. states, cities, and counties also worry. For example, New Hampshire legislators created a commission of experts to study EMF effects. In their report, which was released this November, the experts recommended 15 actions: among the most important, they asked the FCC to study the environmental impact of the 5G antennas and towers and locate them further from schools and homes.

Representative Patrick Abrami, who heads the commission, invited Frank Clegg, Microsoft Canada's CEO for 14 years, to meet with them. Clegg told them, "The industry only focuses on getting its products to market but doesn't deal with health and safety issues. It's self-policing, so we're seeing a Wild West scenario regarding the guidelines. I'm not aware of a single study which shows 5G technology is safe."

How did the ex-CEO of Microsoft Canada do such a turnaround? Clegg says, "After I retired in 2005, I talked to scientists and became convinced the devices can harm you. At this point, my wife and I founded Canadians for Safe Technology to raise people's awareness about the dangers and tell them how to use the devices safely."

Louisiana legislators are also concerned. They asked their environmental agency to study the 5G safety issues. The problem, Moskowitz says, is that "there are no health studies" specifically on exposure to 5G.

Richard Blumental, senator from Connecticut, shares their concerns. At a February 2019 Commerce Committee hearing on 5G, he blasted the FCC and FDA for "failing to conduct research into the safety of 5G technology . . . instead, deferring to industry. We're flying blind here."

Dozens of cities, including Huntington Beach, California; Seattle; and Montgomery County, Maryland, sued the FCC, which they claim has usurped local control in order to promote 5G. They argued that local governments should be able to stop companies from installing thousands of 5G antennas and require that environmental impact studies be made before the companies move forward. But the FCC issued an order to "remove these regulatory barriers." And it won.

The Environmental Health Trust also took the FCC to court: "The FCC refused to update U.S. radiation guidelines, ignoring the vast number of studies that found harm from low-level radiation emitted by wireless devices and cell towers," the EHT's Scarato explains.

The FCC fought back, insisting its 1996 regulations were still adequate. It also repeated its mantra, that 5G will unleash "a wave of entrepreneurship and economic opportunity . . . helping ensure the U.S. wins the global race to 5G." However, in 2019, the District of Columbia Circuit Court of Appeals said the FCC could not eliminate environmental reviews of 5G small-cell infrastructure.

Oral arguments in the EHT case are scheduled for this coming January, but in the meantime, the FCC and telecom companies are forging ahead: the FCC says it can do this—despite local pushback—because the Telecommunications Act of 1996 gives the FCC the sole power to set radiation exposure limits.

Even before the 5G conflict, U.S. cities challenged the industry. In 2010, a San Francisco law required cellphone vendors to warn users about the devices' radiation and limit their children's use. CTIA, the trade group, promptly sued, claiming the law violated the sellers' free speech rights. To flex its economic muscle, CTIA moved its trade show from San Francisco to San Diego. After a three-year fight, the city lost the case in a federal appeals court and backed off—citing the risk of having to pay the industry's legal fees.

Five years later, Berkeley passed a more limited law that required vendors to

educate users about the safety issues. CTIA sued again, arguing it "violated the sellers' first amendment rights." At first, the Circuit Court sided with Berkeley and some vendors complied. But CTIA appealed the decision, arguing that the Berkeley ordnance "over-warned the consumer." Also, the FCC weighed in that Berkeley didn't have the right to inform the public about safety concerns because the FCC gave the public all the data it needed. This time, Berkeley lost.

Scarato notes that Thomas Johnson Jr., the FCC's general counsel for the Berkeley case, was previously at the law firm of Gibson, Dunn and Crutcher, which represented the CTIA when it sued Berkeley.

How users can limit their exposure

Since wireless devices are here to stay (5.2 billion people use them globally), scientists and health advocates say the best course is to limit people's exposure. To this end, California's Department of Public Health says people should use headsets but remove them when not talking, since they release small amounts of radiation even when not in use. Also, they should text instead of talk; carry phones away from their bodies (in backpacks, briefcases, handbags, and tote bags); keep them away from their heads when streaming; and download movies (instead of streaming).

Alasdair Philips, the U.K. scientist, says that modern cellphones use less power and thus emit less radiation than cordless phones (also called satellite phones). But he stresses they are still hazardous and should only be used in areas where reception is strong. Just as important, Philips says, "You should download material, rather than stream it, since streaming emits more radiation. And you should not use ear buds, since these fit deeply inside the ear."

Warnings from industry executives such as Frank Clegg (Microsoft Canada's former CEO) are rare. So, too, are those from governments, since the industry lavishes huge sums on the lawmakers. According to the Center for

Responsive Politics, from 1989 to 2017, the industry gave $101 million to members of Congress and their PACs. Its favorites were Senator John McCain (R-Ariz.), $2.5 million; Rep. Ed Markey (D-Mass.), $1.7 million; Rep. Greg Walden (R-Ore.), $1.6 million; Rep. Fred Upton (R-Mich.), $1.6million; and Rep. Steny Hoyer (D-Md.), $1.4 million. The three most generous donors were AT&T ($19.8 million), Comcast ($14.9 million), and Verizon ($11.2 million). Moreover, the National Institute on Money in Politics says industry lobbying groups plowed $93.7 million into local elections in 2018.

As expected, the largesse continues to be rewarded, and a misinformed public continues its love affair with all things wireless.

Barbara Koeppel is a Washington D.C.-based investigative reporter who covers social, economic, political, and foreign policy issues.

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4 Comments

William Bruno on December 28, 2020 at 8:38 PM

Thanks for this! I just subscribed after seeing this!

Réza Ganjavi on December 29, 2020 at 12:51 AM

Thank you! Well done! The scam is exposed very well in this article. Here's a list of additional lies and scams exposed:

https://emfcrisis.yolasite.com/letters.php

That page includes communications with FCC and FDA — two agencies with deep rooted corruption about the wireless pollution scam.

Sara on December 29, 2020 at 8:09 PM

This is so important. Thanks for publishing. We could use a summary of the key points. It's such a long read, hard to conclude what needs to be done, publicly and privately. Would you advocate a moratorium on 5G?

Morris davidson on December 30, 2020 at 3:11 AM

Fantastic article. Covered all the bases. A couple of things to add: The original statement by Otis Brawley from the American Cancer Society was this: ACS Responds to New Study Linking Cell PhoneRadiation to Cancercancer.org/all-.org /NTP2016?The U.S. National Toxicology Program (NTP) has released partial results(http://biorxiv.org/content/biorxiv/early/2016/05/26/055699.full.pdf) from an animal study of the effectof radiofrequency radiation associated with cell phones. The group found radiofrequency radiation waslinked to a higher risk of two cancers. Below is a response from Otis W. Brawley, M.D., AmericanCancer Society Chief Medical Officer."For years, the understanding of the potential risk of radiation from cell phones has been hampered bya lack of good science. This report from the National Toxicology Program (NTP) is good science. "The NTP report linking radiofrequency radiation (RFR) to two types of cancer marks a paradigm shift inour understanding of radiation and cancer risk. The findings are unexpected; we wouldn't reasonably expect non-ionizing radiation to cause these tumors. This is a striking example of why serious study is so important in evaluating cancer risk. It's interesting to note that early studies on the link between lung cancer and smoking had similar resistance, since theoretical arguments at the time suggested that there could not be a link."The new report covers only partial findings from the study, but importantly one of the two cancerslinked to cell phone radiation was malignant gliomas in the brain. The association with gliomas andacoustic neuromas had been suspected from human epidemiology studies. The second cancer, called aschwannoma, is an extremely rare tumor in humans and animals, reducing the possibility that this is achance finding. And importantly, the study found a 'dose/response' effect: the higher the dose, thelarger the effect, a key sign that this association may be real.
Second: Kane's book "Cellular Telephone Russian Roulette" was so explosive, industry bought all copies that were released. Third: when George Carlo published the results of the first Motorola studies, Ted Wheeler had his house burned down.

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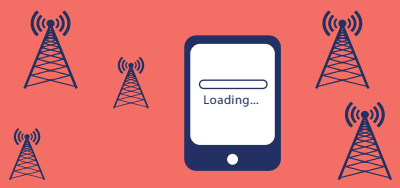
TAHOE WIRELESS BROADBAND AND YOU

REPORTED WIRELESS DATA TRAFFIC (MEGABYTES)

- **Wireless data use almost doubles in just one year.** Wireless data puts the internet in the palm of our hand and allows us to access nearly anything or anyone on the go, and its tremendous value to consumers shows no signs of slowing.
- This year, we saw mobile data grow by **12.89 trillion MBs** to a **total of 28.58 trillion.**
- That's an **82 percent increase** in the last year alone and is more data than was used in the first six and a half years of this decade combined.
- In fact, data use is up over **73 times since 2010.**[1]

NEED MORE TOWERS



Less Towers = Longer Wait

- **A fast wireless network is a critical resource for our community,** and failing to provide fast wireless networks is no different than failing to provide clean drinking water, natural gas, sewage service, or electricity.[3]
- When a disaster occurs people need to know about it. An increasingly large segment of the population use mobile devices instead of landlines. **Receiving alert on mobile devices is vital for emergency preparedness.**
- The World Health Organization (WHO) has classified radio frequency energy as "possibly carcinogenic to humans." **WHO also states that in the last twenty years no adverse health effects have been established as being caused by mobile phone use."**[2]
- The American Cancer Society, the International Agency for Research on Cancer and the National Toxicology Program claim that **cell towers are unlikely to cause cancer.**

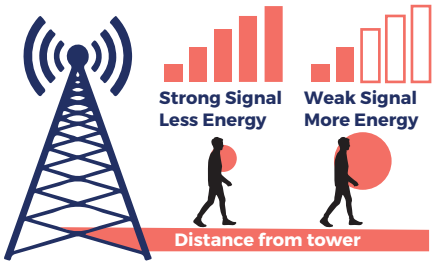
STUDIED FOR SAFETY

FDA FCC

Regulated Levels Are Safe to Humans

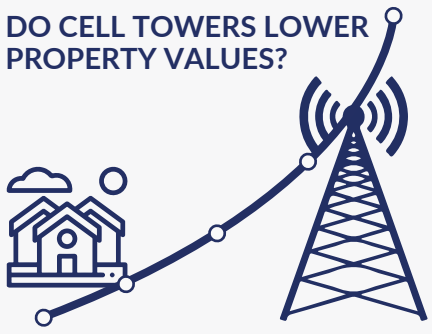
United States Environmental Protection Agency · American Cancer Society · World Health Organization

CELL TOWER SIGNAL



- **Using phones in areas of good reception *decreases* exposure as it allows the phone to transmit at reduced power.** More towers mean better coverage and hence less electromagnetic field radiation exposure from mobile phones.[2]

DO CELL TOWERS LOWER PROPERTY VALUES?



- The distance from a wireless facility has no apparent impact on the value or sale price of a home. The relationship between **the list and sale price remained the same no matter how close the property was to the wireless facility.**[5]

Disinformation

ARE CELLPHONE TOWERS DANGEROUS?

Research by organizations such as the National Institute for Occupational Safety and Health, the environmental Protection Agency (EPA), FCC and others have found **radio frequency energy within the regulated levels are not harmful to humans.**

Radio frequency waves, a form of energy, is released when a mobile device (phone, tablet or laptop) connects with a cell tower.

Different devices create different frequencies on the electromagnetic spectrum. **Some frequencies are harmful to humans while others are not**.

For instance, the frequencies that carry x-rays and gamma rays are on the radioactive end of the electromagnetic spectrum, and can cause harmful damage to the chemical bonds in our DNA.

Radio frequency energy from cell towers and mobile devices is "non-ionizing," similar to radio and television waves.

Tall cell towers keep radio frequency energy high above the ground. **At ground level, radio frequency energy from towers is thousands of times less than the FCC safe exposure limits.** Other antennas, such as those used for radio and television broadcast transmissions, use power levels that are generally much higher than those used for cellular antennas.[6]

DEFINITIONS

Mobile Broadband – The use of high speed internet via mobile devices (smart phone, tablet or laptop) that utilizes frequencies on the electro magnetic spectrum.

Electromagnetic Spectrum – The range of frequencies that emit electromagnetic energy. The lower end of the spectrum has low frequencies and longer waves of energy, while the higher end has high frequencies and shorter waves.

Electromagnetic Energy – Any energy emitted or absorbed by charged particles traveling through space, anything from visible light to nuclear reactions.

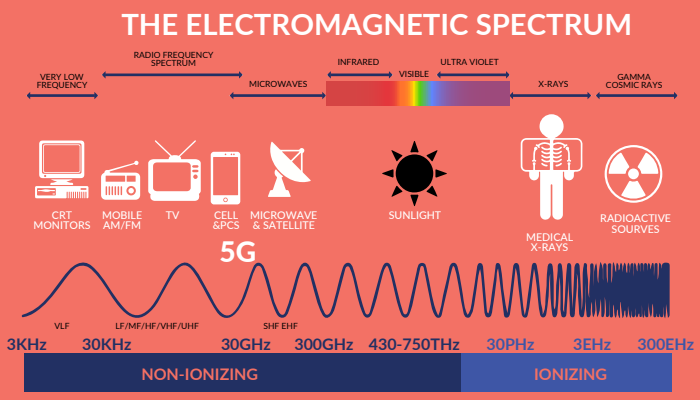
Ionizing and Non-ionizing Energy – Ionizing energy is energy on the high end of the spectrum that is harmful to human DNA. Energies that are on the low end of the spectrum are considered non-ionizing energy and are not harmful to humans.

Radio Frequency Energy - The range of frequencies on the non-ionizing end of the electromagnetic spectrum used for telecommunications devices such as mobile phones, laptops, radios and television.

WHAT THE EXPERTS SAY...

A systematic review of existing academic studies on the potential health risks of radio frequency emissions found that **the majority of research on the subject currently indicates no ill-health related to radio frequency energy exposure**.[7]

Research is ongoing. There is consensus that additional research is warranted to address gaps in knowledge, such as the effects of cell phone use over the long-term and on pediatric populations.[8]



The electromagnetic spectrum. CNET

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2. World Health Organization, Electromagnetic fields and public health: mobile Phones, WHO Fact Sheet #193. June, 2011. Reviewed October 2014
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4. The American Cancer Society www.cancer.org/cancer/cancer-causes/othercarcinogens/atho me/cellular-phone-towers
5. Joint Ventures Wireless Communications Initiative Study - Wireless Facilities Impact on Property Values, November 2012 www.jointventure.org/images/stories/pdf/WirelessFacilitiesImpactOnPropertyValues.pdf
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7. Martin Röösli et al., "Systematic Review on the Health Effects of Exposure to Radiofrequency Electromagnetic Fields from Mobile Phone Base Stations," Bulletin of the World Health Organization 88, no. 12 (December 1, 2010): 887–896F.
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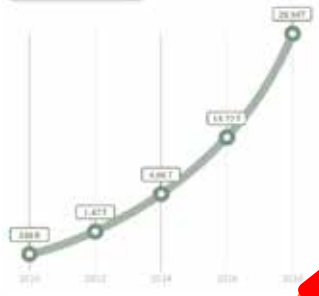

October 2019

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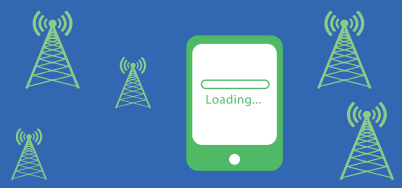

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Refe[illegible]ce [illegible]) Factsheet No 193. Reviewed October 2014

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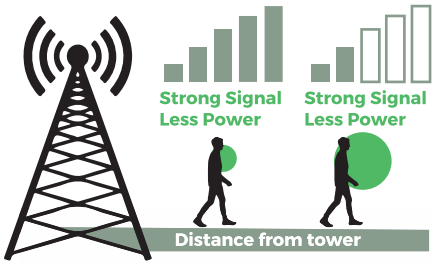
www.dhs.gov/sites/default/files/publications/[illegible]eless[illegible]Emergency%20Alerts%20Mobile%20Penetration%20Strategy.p[illegible]

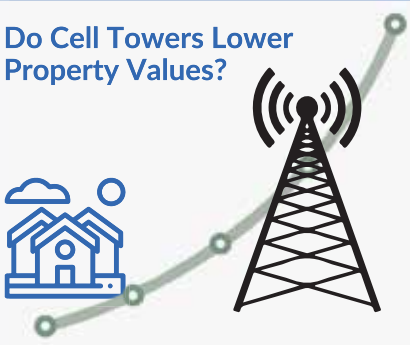
THIS IS NOT A 5G TOWER



• A 5G tower is different than a 4G tower both phy[illegible]ally and functionally: more 5G towers are needed to cover the same amount of space, they're much smaller, and they transmit data on an entirely different part of the radio spectrum.

Reference 4. 5G Cell Towers: Why You See Them and How They Work
https://www.lifewire.com/5g-cell-towers-4584192

Do Cell Towers Lower Property Values?



• The distance from a wireless facility has no apparent impact on the value or sale price of a home. The relationship between the list and sale price remained the same no matter how close the property was to the wireless facility.

Reference 5. Joint Ventures Wireless Communications Initiative Study Wireless Facilities Impact on Property Values November 2012
https://jointventure.org/images/stories/pdf/WirelessFacilitiesImpactOnPropertyValues.pdf

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Radiofrequency (RF) waves, a form of energy, is released when a mobile device (phone, tablet or laptop) connects with a cell tower.

Different devices create different frequencies on the Electro Magnetic Spectrum. Some frequencies are harmful to humans while others are not.

For instance, the frequencies that create x-rays and gamma rays are on the radioactive range of the electromagnetic spectrum, and can cause harmful damage to the chemical bonds in our DNA.

RF energy from cell towers and mobile devices is "non-ionizing," similar to radio and television waves.

Tall cell towers keep RF energy high above the ground. **At ground level, RF energy from towers is thousands of times less than the FCC safe exposure limits.** Other antennas, such as those used for radio and television broadcast transmissions, use power levels that are gener-ally much higher than those used for cellular antennas.˝

What the Experts Say...

A systematic review of existing academic studies on the potential health risks of RF emissions found that the majority of research on the subject currently indicates no ill-health related to RF energy exposure.

The World Health Organization (WHO) has classified RF energy as "possibly carcinogenic to humans." WHO also states that in the last twenty years "no adverse health effects have been established as being caused by mobile phone use."

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